07-743,383

d 124 all 1

01-244619 Sep. 29, 1989 L24: 1 of 1

PLASMA DRY ETCHING PROCESS

INVENTOR: KOICHI ONO, et al. (3)
ASSIGNEE: MITSUBISHI ELECTRIC CORP
APPL NO: 63-72726
DATE FILED: Mar. 25, 1988
PATENT ABSTRACTS OF JAPAN
ABS GRP NO: E865
ABS VOL NO: Vol. 13, No. 581
ABS PUB DATE: Dec. 21, 1989

01-244619 Sep. 29, 1989 L24: 1 of 1

PLASMA DRY ETCHING PROCESS

INT-CL: H01L 21*302

07-743, 383

d all 2

Ø3-41728 Feb. 22, 1991 L14: 2 of 6
MANUFACTURE OF SEMICONDUCTOR DEVICE

INVENTOR: TOSHIYUKI ISHIDA
ASSIGNEE: FUJITSU LTD, et al. (90)
APPL NO: Ø1-176811
DATE FILED: Jul. 7, 1989
PATENT ABSTRACTS OF JAPAN
ABS GRP NO: E1064
ABS VOL NO: Vol. 15, No. 179

Ø3-41728 Feb. 22, 1991 L14: 2 of 6
MANUFACTURE OF SEMICONDUCTOR DEVICE

ABS PUB DATE: May 8, 1991
INT-CL: H01L 21*302; H01L 21*28; H01L 21*3205

ABSTRACT:

PURPOSE:To prevent the after corrosion of wirings comprising an Al alloy film, especially an Al-Cu alloy film by performing dry etching for an Al film and an Al alloy film on a semiconductor substrate by using chlorine based reaction gas, and exposing the semiconductor substrate to steam in a pressure reduced atmosphere.

CONSTITUTION:A resist film 8 on an Si substrate 5 is patterned, and a resist pattern 8a is formed. With the resist pattern 8a as a mask, an Al-Cu

Ø3-41728 Feb. 22, 1991 L14: 2 of 6
MANUFACTURE OF SEMICONDUCTOR DEVICE

alloy film 7 is etched by a reactive sputter etching method using $SiCl_4/Cl_2$ mixed gas. In order to remove the resist pattern 8a that is used as the mask, the device is put into an ashing chamber 12 wherein pressure is reduced beforehand. Steam is introduced into a chamber 31. At this time, the steam reacts with $AlCl_3$ and $CuCl_xCl_y$ which remain on the surface of a wafer 5. Thus, hydrolysis of the $AlCl_3$ and $CuCl_xCl_y$ can be readily performed.a

INVENTOR: KENJI TATEIWA
ASSIGNEE: MATSUSHITA ELECTRIC IND CO LTD, et al. (90)
APPL NO: 63-321198
DATE FILED: Dec. 20, 1988
PATENT ABSTRACTS OF JAPAN
ABS GRP NO: E0978
ABS VOL NO: Vol. 14, No. 429
ABS PUB DATE: Sep. 14, 1990
INT-CL: H01L 21*90; H01L 21*316

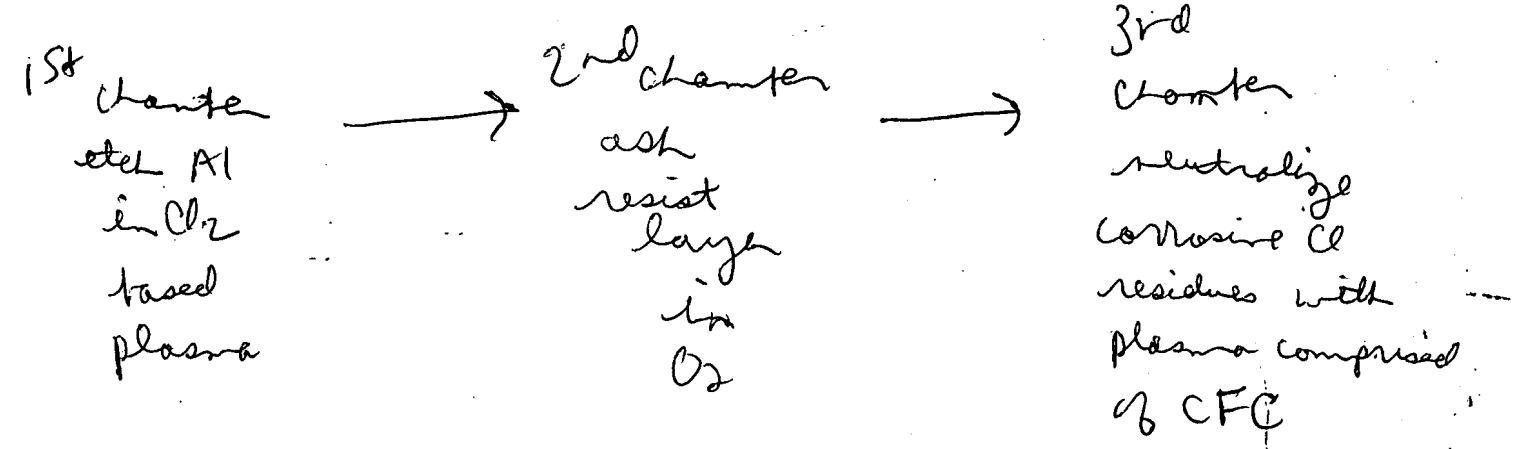
ABSTRACT:

PURPOSE:To prevent defect by wiring cut caused by residual chlorine

02-165656 Jun. 26, 1990 L26: 5 of 9
MANUFACTURE OF SEMICONDUCTOR DEVICE

by removing a resist and forming an insulating film without opening it to the air after etching of metal in vacuum.

CONSTITUTION:For a wafer, the aluminum is etched in the first chamber 1, and it is shifted in vacuum to the second chamber 2 and the resist removed by oxygen plasma. At this time, most of the residual chlorine remaining at the sidewall of aluminum is removed. Next, the surface is cleaned by letting it pass through plasma by CFC gas in the third chamber 3, and then an insulating film is accumulated by the plasma CVD method in the fourth chamber 4. The resist is removed as it is in vacuum without opening it to the air and the interlayer insulating film is accumulated after etching of aluminum, so even if chlorine remains at the side face of aluminum it never reacts with the moisture and the corrosion never occurs.r



02-165656 Jun. 26, 1990 L26: 5 of 9
MANL :TURE OF SEMICONDUCTOR DEV LE

02-90585 Mar. 20, 1990 L26: 6 of 9
TREATMENT AFTER DRY ETCHING

INVENTOR: HIRONORI KAWAHARA, et al. (2)
ASSIGNEE: HITACHI LTD
APPL NO: 63-228714
DATE FILED: Sep. 14, 1988
PATENT ABSTRACTS OF JAPAN
ABS GRP NO: C0727
ABS VOL NO: Vol. 14, No. 270
ABS PUB DATE: Jun. 12, 1990
INT-CL: C23F 4*00; H01L 21*302

02-90585 Mar. 20, 1990 L26: 6 of 9
TREATMENT AFTER DRY ETCHING

ABSTRACT:

PURPOSE:To produce a satisfactory corrosion preventing effect by successively treating an etched substrate to be [illegible]

L23: 6 of 24

US PAT NO: 4,824,753
INVENTOR: Hideo Hotomi, Suita, Japan
Shigeyuki Hakumoto, Toyonaka, Japan

L23: 10 of 24

US PAT NO: 4,505,947 [IMAGE AVAILABLE]
DATE FILED: Jul. 14, 1982
INVENTOR: Vladimir Vukanovic, Rochester, NY
Susannah M. Butler, Rochester, NY
George Fazekas, Rochester, NY
John R. Miller, Rochester, NY

L23: 20 of 24

US PAT NO: 4,212,719
DATE FILED: Aug. 18, 1978
INVENTOR: Yoshihito Osada, Yokohama, Japan
Alexis T. Bell, Oakland, CA
Mitchel M. Shen, Piedmont, CA

L23: 20 of 24

US PAT NO: 4,212,719

L21 ANSWER 25 OF 48 COPYRIGHT 1993 ACS

AN CA107(4):29514j

TI Basic processes in ***glow*** ***discharge*** ***plasmas***

AU Venugopalan, M.

CS Dep. Chem., West. Illinois Univ.

LO Macomb, IL 61455, USA

SO Nucl. Instrum. Methods Phys. Res., Sect. B, B23(4), 405-17

SC 71-0 (Nuclear Technology)

SX 76

DT J

CO NIMBEU

IS 0168-583X

PY 1987

LA Eng

AB A review with 62 refs. in which the d.c. and radio-frequency ***glow*** ***discharge*** ***plasmas*** are described in terms of their evolution, mechanism, spatial characteristics, and voltage-current relation. The basic ***plasma*** processes, such as excitation, ionization/dissocn. and recombination are reviewed using examples of the chem. reactive H2 + O2/H2O and N2 +/NH3 ***plasmas*** . This is followed by a discussion of some of the heterogeneous processes occurring at the walls and substrates, namely film formation, ***etching*** , nitriding and analogous reactions.

KW review ***glow*** ***discharge*** ***plasma*** ; fusion ***plasma*** ***glow*** ***discharge*** review

IT Nuclear fusion reactor fuels and ***plasmas***
(erosion by, basic processes in ***glow*** ***discharge***

07-743383

=> d 129 ti ccls fd in 1,5

US PAT NO: 5,135,608 [IMAGE AVAILABLE] L29: 1 of 6
TITLE: Method of producing semiconductor devices
US-CL-CURRENT: 156/643; 118/50.1, 620, 728; 156/345, 646, 656, 662; 204/298.25, 298.35
DATE FILED: Jul. 10, 1990
INVENTOR: Ken Okutani, Fussa, Japan

US PAT NO: 4,985,113 [IMAGE AVAILABLE] L29: 5 of 6
TITLE: Sample treating method and apparatus

US PAT NO: 4,985,113 [IMAGE AVAILABLE] L29: 5 of 6
US-CL-CURRENT: 156/643; 134/1; 156/345, 646, 651, 656, 659.1, 665; 204/192.35, 298.33, 298.37; 252/79.1; 427/38
DATE FILED: Mar. 7, 1990
INVENTOR: Kotaro Fujimoto, Kudamatsu, Japan
Yoshie Tanaka, Kudamatsu, Japan
Hironobu Kawahara, Kudamatsu, Japan
Yoshiaki Sato, Kudamatsu, Japan

=> d 136 ti ccls in fd 1

US PAT NO: 5,138,973 [IMAGE AVAILABLE] L36: 1 of 88
TITLE: Wafer processing apparatus having independently controllable energy sources
US-CL-CURRENT: 118/723, 719; 156/345, 643; 427/39, 45.1, 54.1
INVENTOR: Cecil J. Davis, Greenville, TX

US PAT NO: 5,138,973 [IMAGE AVAILABLE] L36: 1 of 88
Rhett B. Jucha, Celeste, TX
Joseph D. Luttmer, Richardson, TX
Rudy L. York, Plano, TX
Lee M. Loewenstein, Plano, TX
Robert T. Matthews, Plano, TX
Randall C. Hildenbrand, Richardson, TX
DATE FILED: Dec. 5, 1988

=> d 137 ti ccls in fd 5

US PAT NO: 4,842,676 L37: 5 of 8
TITLE: Process for etch of tungsten
US-CL-CURRENT: 156/643, 646, 656, 659.1
INVENTOR: Rhett B. Jucha, Celeste, TX
Cecil J. Davis, Greenville, TX
Lee M. Loewenstein, Plano, TX

US PAT NO: 4,842,676 L37: 5 of 8
DATE FILED: Nov. 17, 1987

=> d 139 ti ccls in fd 1

5,037,167 Limited Available L37: 1 of 1

TITLE: Ashing method for removing an organic film on a substanc. of a semiconductor device under fabrication

US-CL-CURRENT: 156/643; 134/1; 156/646. 651, 655, 668; 204/192.36; 252/79.1

INVENTOR: Keisuke Shinagawa, Kawasaki, Japan
Shuzo Fujimura, Tokyo, Japan
Kenichi Hikazutani, Kuwana, Japan

DATE FILED: May 18, 1990

=>

L12 ANSWER 2 OF 3 COPYRIGHT 1992 ACS

AN CA114(26):258218

TI A method of etching a sample of aluminum-containing material

AU Fukuyama, Ryoji; Kakehi, Yutaka; Nawata, Makoto; Kawahara, Hironobu; Sato, Yoshiaki; Torii, Yoshimi; Kawaraya, Akira; Sato, Yoshie

CS Hitachi, Ltd.

LO Japan

SO Eur. Pat. Appl., 18 pp.

PI EP 416774 A2 13 Mar 1991

DS R: DE, FR, GB

AI EP 90-309184 29 Aug 1990

PRAI JP 89-221353 30 Aug 1989
JP 89-270471 18 Nov 1989
JP 90-117594 7 May 1990

IC ICM H01L021-3065

SC 76-11 (Electric Phenomena)

DT P

CO EPXXBK

PY 1991

LA Eng

AB A post-etch treatment method is provided which is capable of imparting high corrosion prevention performance to Al-contg. wiring films. The sample of Al-contg. wiring material that is etched using the halogen-type gas is treated with the plasma of a gas that has an O component, and the resist formed on the Al-contg. wiring material is reacted with O and is removed. Further, a plasma is generated using a gas having a H component or this gas is liquefied into droplets thereof on the sample surface, so that halogen components (Cl, Br, etc.) adhered to the Al-contg. wiring material through the etching treatment are reacted with H and are effectively removed in the form of HCl or HBr.

KW aluminum wiring plasma etching

IT Halogens
(in plasma etching of aluminum-contg. material)

IT Resists
(removal of, by oxygen treatment, after plasma etching of aluminum-contg. material)

IT Electric conductors
(wiring, aluminum-contg., plasma etching of)

IT Sputtering
(etching, of aluminum-contg. material)

IT Etching
(sputter, of aluminum-contg. material)

IT 64-17-5, Ethanol, uses and miscellaneous 67-56-1, Methanol, uses and miscellaneous 67-64-1, Acetone, uses and miscellaneous 74-82-8, Methane, uses and miscellaneous 1333-74-0, Hydrogen, uses and miscellaneous ***7732-18-5*** , Water, vapor 7782-41-4, Fluorine, uses and miscellaneous ***7782-44-7*** , Oxygen, uses and miscellaneous 10024-97-2, Nitrogen oxide (N2O), uses and miscellaneous 10028-15-6, Ozone, uses and miscellaneous
(in plasma etching of aluminum-contg. material)

IT 7429-90-5, Aluminum, reactions
(plasma etching of)

-5- (JAPIO)
AN - 91-060031
TI - MANUFACTURE OF SEMICONDUCTOR DEVICE
PA - (2000218) SONY CORP
IN - SHINOHARA, KEIJI
PN - 91.03.15 J03060031, JP 03-60031
AP - 89.07.27 89JP-195315, 01-195315
SO - 91.05.30 SECT. E, SECTION NO. 1073; VOL. 15, NO. 213, PG. 18.
IC - H01L-021/302; H01L-021/3205
JC - 42.2 (ELECTRONICS--Solid State Components)
AB - PURPOSE: To prevent after corrosion by etching a lamination structure section using a resist layer as a mask and thereafter by ashing the resist layer using a mixture gas made by adding a specified amount of hydrogen fluoride carbide gas to oxygen-based gas.
CONSTITUTION: A barrier metal consisting of a titanium layer 2 and a titanium nitride layer 3 and a lamination structure section consisting of an aluminum wiring layer 4 laminated thereon are etched using a resist layer 6 as a mask. Then, the resist layer 6 is ashed by using a mixture gas made by adding 1 to 50vol.% of hydrogen fluoride carbide gas containing two or more hydrogen atoms in one molecule to oxygen-based gas. Thereby, chlorine or chlorine compound remaining in each layer forming a surface or a lamination structure section of a wafer is evaporated and removed simultaneously with removal of the resist layer. After corrosion can be also prevented in a micronized semiconductor device in this way.

-6- (JAPIO)
AN - 87-076722
TI - MANUFACTURE OF SEMICONDUCTOR DEVICE
PA - (2000307) TOSHIBA CORP
IN - ISHIKAWA, MICHIHIRO
PN - 87.04.08 J62076722, JP 62-76722
AP - 85.09.30 85JP-216864, 60-216864
SO - 87.09.08 SECT. E, SECTION NO. 538; VOL. 11, NO. 277, PG. 28.
IC - H01L-021/28
JC - 42.2 (ELECTRONICS--Solid State Components)
AB - PURPOSE: To integrate a semiconductor device by a film patterned in X and Y direction widths of a predetermined connecting hole, filling electrode material, etching it and forming a wiring layer connected with a substrate in a self- aligning manner.
CONSTITUTION: An N+ type layer 20 is formed on a P-type Si substrate 10, an Mo film 40 is superposed through an SiO(sub 2) film 30, a resist mask 50 is coated, the film 40 is etched by RIE in a predetermined width in AA' direction to remove the resist 50. Then, the pattern of a resist 60 opened in BB' direction in a predetermined width is superposed, the crossing portion of the hole of the film 40 and the resist 60 is etched by RIE to form a connecting hole 100. A polysilicon film 70 is coated, P is then doped, the entire surface is then etched to expose the film 40. The film 40 is eventually separated with mixture solution of H(sub 2)SO(sub 4)+H(sub 2)O(sub 2) water, and the film 70 connected with the layer 20 is formed in a self-aligning manner. According to this configuration, the margin of the electrode wirings is not necessarily

prepared for electrode wiring to set small electrode wiring interval.

-7- (JAPIO)
AN - 85-154526
TI - PATTERN FORMING PROCESS
PA - (2000423) NEC CORP
IN - IINO, TERUO
PN - 85.08.14 J60154526, JP 60-154526
AP - 84.01.23 84JP-010452, 59-10452
SO - 85.12.17 SECT. E, SECTION NO. 367; VOL. 9, NO. 321, PG. 114.
IC - H01L-021/30; G03F-007/20; H01L-021/302
JC - 42.2 (ELECTRONICS--Solid State Components); 29.1 (PRECISION INSTRUMENTS--Photography & Cinematography)
FKW - R004 (PLASMA); R129 (ELECTRONIC MATERIALS--Super High Density Integrated Circuits, LSI & GSI)
AB - PURPOSE: To produce organic high molecular film patterns efficiently by a method wherein an organic high molecular film, an oxide film, a halogenated silver emulsion film are exposed for development on an Si substrate to be successively etched utilizing silver patterns as masks. CONSTITUTION: When a halogenated silver emulsion film 4 is selectively exposed to be processed in developing and fixing solution and distilled water utilizing a contracted projection type aligner, silver patterns 4' are separated in gelatin at the exposed parts while the other silver patterns 4" at the unexposed parts are resolved leaving gelatin only. After heating an Si substrate 1 in H(sub 2) at 150 Deg. C, RIE is performed by using Ar+N(sub 2) and only silver paterns 4' are left. Next an SiO film 3 is etched utilizing CF(sub 4)+He and masks 4" and finally RIE is performed using O(sub 2) to open holes in an organic high molecular film 2 simultaneously etching the silver patterns 4'. In such a constitution, the halogenated silver emulsion film 4 may be exposed from around 0.1X10-(sup 7)sec while it is being shifted improving the exposing function of a wafer by 5-10 times magnitude utilizing the contracted projection type aligner.

SS 17?
file inspec

ELAPSED TIME ON JAPIO: 0.09 HRS.
$15.30 EST COST CONNECT TIME.
$3.85 EST COST ONLINE PRTS: 7
$19.15 EST TOTAL COST THIS JAPIO SESSION.

YOU ARE NOW CONNECTED TO INSC.
COVERS FROM 1977 THRU WEEKLY UPDATE (9329)
SEE FILE INBK FOR COVERAGE FROM 1969 THROUGH 1976.

SS 1?
recall etch

*SEARCHING.....

OCCURS	TERM
119799	AL
15499	ALUMINUM:
409	ALSI
32	ALCUSI
83	ALSICU
135187	PLASMA:
1147	RIE
35209	ETCH:
44813	SPUTTER:
14485	CORONA:

```
  8114     GLOW:
 60088     DISCHARGE:
 19726     CL
    12     CL2
  6549     CHLORINE:
   737     ANTICORR:
 27737     CORRO:
 45400     POST:
  6372     RESIDUE:
207224     O
   471     O2
   124     O3
  4598     OZONE:
 61113     OXYGEN:
    56     H2O
104722     WATER:
206532     H
   276     H2
 92987     HYDROGEN:
     0     SPUTTER?
  1147     RIE
     0     ETCH?
     0     PLASMA?
     0     D AB
SS 1:  AL OR ALUMINUM: OR ALSI OR ALCUSI OR ALSICU  (123699)
SS 2:  PLASMA: OR RIE OR ETCH: OR SPUTTER: OR CORONA: OR GLOW: (3W)
  DISCHARGE:  (168547)
SS 3:  CL OR CL2 OR CHLORINE:  (21792)
SS 4:  ANTICORR: OR CORRO: OR POST: OR RESIDUE:  (73254)
SS 5:  O OR O2 OR O3 OR OZONE: OR OXYGEN:  (225727)
SS 6:  H2O OR WATER:  (101501)
SS 7:  1 (15W) 2  (1886)
SS 8:  3 AND 7 AND 4  (36)
SS 9:  5 AND 8  (13)
SS 10:  H OR H2 OR HYDROGEN:  (227852)
SS 11:  (  6 OR 10  ) AND 9  (8)
SS 12:  2 AND 5 AND 6 AND 10  (592)
SS 13:  12 AND (  (  ETCH? AND PLASMA?  ) OR SPUTTER? OR RIE  )  (6)
SS 14:  D AB  (0)

SS 15?
ss 11 or ss 13


SS 15 RESULT (13)

SS 16?
pr ti 13


TERM (PR TI 13) NOT FOUND.
SS 16 RESULT (0)

SS 17?
prt ti 13


RECORDS SELECTED FROM SS 15.

-1-    (INSC)
TI   - Removal of fluorocarbon residues on CF/sub 4//H/sub 2/
       reactive-ion-etched silicon surfaces using a hydrogen plasma (IN J.
       Electrochem. Soc. (USA))

-2-    (INSC)
TI   - Post-treatments for reactive ion etching of Al-Si-Cu alloys (IN J.
```

Electrochem. Soc. (USA))

-3- (INSC)
TI - Effect of post-etch treatment on chlorine concentration of AlSi and Ti-capped AlSi films (IN J. Vac. Sci. Technol. B, Microelectron. Process. Phenom. (USA))

-4- (INSC)
TI - Damage free Al reactive-ion-etching for high frequency SAW devices (IN Sixth IEEE/CHMT International Electronic Manufacturing Technology Symposium. Proceedings 1989 Japan IEMT Symposium (Cat. No.89CH2741-7), Nara, Japan, 26-28 April 1989)

-5- (INSC)
TI - Ashing of ion-implanted resist layer (IN Jpn. J. Appl. Phys. 2, Lett. (Japan))

-6- (INSC)
TI - A novel photooxidative scheme for imaging at polymer surfaces (IN Proc. SPIE - Int. Soc. Opt. Eng. (USA), Advances in Resist Technology and Processing VI, San Jose, CA, USA, 27 Feb.-1 March 1989)

-7- (INSC)
TI - Spin-coatable inorganic resists based on novel peroxopolyniobotungstic acids for bilayer lithography (IN J. Electrochem. Soc. (USA))

-8- (INSC)
TI - Plasma etching of aluminum-A comparison of chlorinated etchants

-9- (INSC)
TI - Peroxopolytungstic acids: a new inorganic resist material (IN Appl. Phys. Lett. (USA))

-10- (INSC)
TI - Corrosion protection of Al alloys by solution cast Ta/sub 2/O/sub 5/ (IN Electronic Packaging Materials Science. Materials Research Society Symposia Proceedings, Boston, MA, USA, 27-29 Nov. 1984)

-11- (INSC)
TI - Reliability effects of fluorine contamination of aluminum bonding pads on semiconductor chips (IN Solid State Technol. (USA))

-12- (INSC)
TI - New dry etch for Al and Al-Cu-Si alloy: reactively masked sputter etching with SiF/sub 4/ (IN Appl. Phys. Lett. (USA))

-13- (INSC)
TI - Reactive ion etching induced corrosion of Al and Al-Cu films (IN Third Annual Microelectronics Measurement Technology Seminar Proceedings, San Jose, CA, USA, 17-18 March 1981)

SS 17?

prt fu 2-5,8,12-13

RECORDS SELECTED FROM SS 15.

-2- (INSC)
AN - A91050044
TI - Post-treatments for reactive ion etching of Al-Si-Cu alloys (IN J. Electrochem. Soc. (USA))
AU - Mayumi, S.; Hata, Y.; Hujiwara, K.; Ueda, S.
OS - Kyoto Res. Lab., Matsushita Electron. Corp., Japan
SO - J. Electrochem. Soc. (USA), vol.137, no.8, PP.2534-8, Aug. 1990, 14 REF.
JC - JESOAN
DT - J (JOURNAL PAPER)
NU - ISSN 00134651
CC - *A8160B
TC - EX (EXPERIMENTAL)
IT - aluminium alloys; copper alloys; corrosion; silicon alloys; sputter etching
ST - Auger spectroscopy; reactive ion etching; corrode; cleaning step; post-treatments; X-ray photoelectron spectroscopies; etching plasma; protecting film; Al-Si-Cu alloys; H/sub 2/O rinse; O/sub 2/ plasma; Cl
MF - Cl/el; AlSiCu/sur Al/sur Cu/sur Si/sur AlSiCu/as Al/as Cu/as Si/as; H2O/bin H2/bin H/bin O/bin; O2/el O/el
AB - Aluminum alloy (Al-0.9%Si-0.4%Cu) conductors etched with chlorine-containing plasma corrode in humid atmosphere or in aqueous solutions of a cleaning step unless appropriate post-treatments are performed. The effect of the post-treatments of CF/sub 4/, CF/sub 4//O/sub 2/, O/sub 2/ plasmas, and H/sub 2/O rinse on suppressing the corrosion of the conductors was investigated using Auger electron and X-ray photoelectron spectroscopies. Residual chlorine deposited on the sidewall of the conductor, which was exposed to the etching plasma, was found to contribute to the corrosion. The corrosion was accelerated with increasing chlorine concentration. Some chlorine atoms on the as-etched metal surface were bound to aluminum and the others were bound to carbon. An H/sub 2/O rinse drastically removed chlorine bound to aluminum but had little effect on chlorine bound to carbon. O/sub 2/ plasma treatment removed chlorine bound to carbon but hardly removed chlorine bound to aluminum. CF/sub 4//O/sub 2/ plasma, particularly O/sub 2/-rich CF/sub 4//O/sub 2/ plasma, was found to be the most effective in removing chlorine, since it removed chlorine bound not only to aluminum but also to carbon. Also a protecting film formed on the sidewall of conductors with fluorine-containing plasma was found to work as an excellent mask against the corrosion.

-3- (INSC)
AN - B91009311

TI - Effect of post-etch treatment on chlorine concentration of AlSi and Ti-capped AlSi films (IN J. Vac. Sci. Technol. B, Microelectron. Process. Phenom. (USA))
AU - Maa, J.; Goessenberger, H.; Paff, R.J.
OS - David Sarnoff Res. Center, SRI, Princeton, NJ, USA
SO - J. Vac. Sci. Technol. B, Microelectron. Process. Phenom. (USA), vol.8, no.5, PP.1052-7, Sept.-Oct. 1990, 16 REF.
JC - JVTBD9
CN - 0734-211X/90/051052-06 $01.00
DT - J (JOURNAL PAPER)
NU - ISSN 0734211X
CC - *B2550F; B2550E
TC - EX (EXPERIMENTAL)
IT - aluminium alloys; metallic thin films; metallisation; silicon alloys; sputter etching; X-ray fluorescence analysis
ST - metallisation layers; single step treatment; reactive ion etching; post-etch treatment; post-etch corrosion; multiple-step treatment; baking; partial resist stripping; water rinse; resist partial stripping; wet stripping; surface concentration; Al-Si films; AlSi-Si; Cl/sub 2/ medium; AlSi-Ti; Ti capping; AlSi:Cl
MF - AlSi-Si/int AlSi/int Al/int Si/int AlSi/bin Al/bin Si/bin Si/el; Cl2/el Cl/el; AlSi-Ti/int AlSi/int Al/int Si/int Ti/int AlSi/bin Al/bin Si/bin Ti/el; Ti/sur Ti/el; AlSi:Cl/sur AlSi/sur Al/sur Cl/sur Si/sur AlSi:Cl/ss Al/ss Cl/ss Si/ss AlSi/bin Al/bin Si/bin Cl/el Cl/dop; AlSi/sur Al/sur Si/sur AlSi/ss Al/ss Si/ss
AB - Ti-capped Al-Si films are more susceptible to post-etch corrosion than uncapped Al-Si films. The extent of corrosion of Ti-capped films is related to post-etch treatment. Various post-etch treatments to reduce chlorine concentration are evaluated by X-ray fluorescence analysis. Results of single- and multiple-step treatment, such as baking, partial resist stripping in oxygen plasma in the exit chamber, water rinse, and resist partial stripping followed by wet stripping are presented. A method to estimate the surface concentration of chlorine in atoms/cm/sup 2/ is described; the chlorine concentration in most cases is less than 5*10/sup 15/ atoms/cm/sup 2/.

-4- (INSC)
AN - B90028993
TI - Damage free Al reactive-ion-etching for high frequency SAW devices (IN Sixth IEEE/CHMT International Electronic Manufacturing Technology Symposium. Proceedings 1989 Japan IEMT Symposium (Cat. No.89CH2741-7), Nara, Japan, 26-28 April 1989)
AU - Yuhara, A.; Mizutani, T.; Hosaka, N.; Yamada, J.; Iwama, A.
OS - Hitachi Ltd., Yokohama, Japan; ; IEEE
SO - Sixth IEEE/CHMT International Electronic Manufacturing Technology Symposium. Proceedings 1989 Japan IEMT Symposium (Cat. No.89CH2741-7), IEEE, xvi+366 PP., PP.176-9, 1989, 16 REF.
CN - CH2741-7/89/0000-0176 $1.00
DT - PA (CONFERENCE PAPER)
CC - *B2860C
TC - AP (APPLICATIONS); PR (PRACTICAL); EX (EXPERIMENTAL)
IT - acoustic wave propagation; aluminium; sputter etching; surface acoustic wave devices
ST - reactive-ion-etching; SAW devices; RIE; fine electrodes; discharge excited; cleaning; dispersion; SAW velocity; high-energy electron diffraction; etch depth; surface roughness; 13.56 MHz; LiNbO/sub 3/; LiTaO/sub 3/; BCl/sub 3/; Al etch rate
MF - LiNbO3/sur NbO3/sur Li/sur Nb/sur O3/sur O/sur LiNbO3/ss NbO3/ss Li/ss Nb/ss O3/ss O/ss; LiTaO3/sur TaO3/sur Li/sur O3/sur Ta/sur O/sur LiTaO3/ss TaO3/ss Li/ss O3/ss Ta/ss O/ss; BCl3/bin Cl3/bin Cl/bin B/bin; Al/int Al/el
NM - frequency Hz=E07*1.356
AB - The RIE (reactive ion etching) of Al is studied for the fabrication of fine electrodes in high-frequency SAW (surface acoustic wave) devices on substrates such as LiNbO/sub 3/ and LiTaO/sub 3/, using a discharge excited at 13.56 MHz in gases containing BCl/sub 3/. Sputter-

with CF/sub 4/, cleaning of the chamber, and postcleaning the samples just after RIE are shown to improve reproducibility of the etching markedly by removing defects connected with Cl and Al. Analyses of H-atom emission from Ar and CF/sub 4/ discharges show the effect of treatments that remove Cl and H/sub 2/O. Damage of substrates surfaces is investigated by measuring the dispersion of SAW velocity, reflected high-energy electron diffraction, etch depth, and surface roughness on the substrates. These measurements reveal the existence of a threshold for reactive ions. Below the threshold, although reactive ions slightly etch the amorphous surface layer caused by polishing, the damage is negligible for SAW propagation. The distribution of Al etch rate is equalized, which is different from the case of Si substrates. By using RIE with the abovementioned condition, precise, fine Al electrodes are replicated for high-frequency SAW devices on substrate composed of Li compounds.

-5- (INSC)
AN - B90021787
TI - Ashing of ion-implanted resist layer (IN Jpn. J. Appl. Phys. 2, Lett. (Japan))
AU - Fujimura, S.; Konno, J.; Hikazutani, K.; Yano, H.
OS - Process Dev. Div., Fujitsu Ltd., Kawasaki, Japan
SO - Jpn. J. Appl. Phys. 2, Lett. (Japan), vol.28, no.10, PP.2130-6, 1989
JC - JAPLDA
DT - J (JOURNAL PAPER)
NU - ISSN 00214922
CC - *B2550G; B2550E; B2550B
TC - EX (EXPERIMENTAL)
IT - ion implantation; nuclear magnetic resonance; polymer films; resists; sputter etching; X-ray photoelectron spectra
ST - ion-implanted resist layer; stripping method; chemical structure; carbonized layers; solid NMR; residues; XPS; etching rate; polymers; two-step ashing; downstream ashing; O/sub 2/ plasma ashing; H/sub 2/ reactive ion etching
MF - H2/el H/el; O2/el O/el
AB - The stripping method of high-dose ion-implanted resist layers was studied on the basis of the chemical structure of carbonized layers formed by ion implantation and that of residues remaining on the water surface after O/sub 2/ plasma ashing. The chemical structure of the carbonized layer was observed with solid NMR and that of residues was analyzed with XPS. A decrease in the etching rate of the high-dose ion-implanted resist was caused by carbonization of polymers of the resist. Residues were mainly formed during O/sub 2/ plasma ashing by chemical reaction between oxygen and implanted species, i.e. the main component of residues was oxide of the implanted species. On the basis of these results, to remove the high dose ion implanted resist without damage, the authors developed a two-step ashing process which was composed of H/sub 2/ RIE and downstream ashing, and achieved the purpose.

-8- (INSC)
AN - A87113771
TI - Plasma etching of aluminum-A comparison of chlorinated etchants
AU - Danner, D.A.; Dalvie, M.; Hess, D.W.
OS - Dept. of Chem. Eng, California Univ., Berkeley, CA, USA
SO - J. Electrochem. Soc. (USA), vol.134, no.3; PP.669-73, March 1987, 43 REF.
JC - JESOAN
DT - J (JOURNAL PAPER)
NU - ISSN 00134651
CC - *A8160B
TC - EX (EXPERIMENTAL)
IT - aluminium; sputter etching
ST - tetrachloromethane; chlorinated etchants; plasma-assisted etching; RF glow discharges; native oxide reduction; rate-limiting processes; etch gas dissociation eff[illegible]e; BCl/sub 3/; SiCl/sub 4/; Al; BCl/sub 2/
MF - Al/sur Al/el; BC13/bin C13/bin Cl/bin B/bin; BC12/bin[illegible]2/bin Cl/bin

and controlled. The mechanisms underlying this corrosion problem were investigated using Auger electron spectroscopy (AES) and X-ray photoelectron spectroscopy (XPS). An accelerated corrosion chamber containing a continuous flow of filtered air with a relative humidity of 70% at 25 degrees C and trace amounts of Cl/sub 2/, SO/sub 2/, H/sub 2/S, and NO/sub 2/ was used to obtain relative corrosion rates of samples processed in various ways. This rapid corrosion can be largely suppressed by a deionized water rinse immediately upon removing the samples from the vacuum chamber. Finally, a thermal oxidation treatment was found to be effective in improving the corrosion resistance of plasma-etched samples. Optimum conditions appear to occur at temperatures of approximately 300-350 degrees C and 1 atmosphere O/sub 2/ pressure for >or approximately=30-45 minutes.

SS 17?
stop y

SESSION FINISHED 07/26/93 10:44 A.M. (CENTRAL TIME)
ELAPSED TIME ON INSC: 0.13 HRS.
$16.38 EST COST CONNECT TIME.
$17.00 EST COST ONLINE PRTS: 20
$33.38 EST TOTAL COST THIS INSC SESSION.

ELAPSED TIME THIS SESSION: 0.51 HRS.
$65.45 EST COST CONNECT TIME.
$6.63 EST COST TELECOM.
$24.85 EST COST ONLINE PRTS: 32
$90.30 EST TOTAL COST THIS TERMINAL SESSION.

ORBIT SEARCH SESSION COMPLETED. THANKS FOR USING ORBIT!

AB - The plasma-assisted etching of aluminum in chlorine containing RF glow discharges has been studied. Use of a single parallel plate reactor permitted a direct comparison of etch results between BCl/sub 3/, BCl/sub 3//Cl/sub 2/, CCl/sub 4/, and SiCl/sub 4/. Separation of aluminum etching into native oxide reduction and water vapor/oxygen scavenging, and metal film etching allowed the likely rate-limiting processes in the etch cycle to be ascertained for the different etch gases. The longer initiation period observed with CCl/sub 4/ and SiCl/sub 4/ compared to BCl/sub 3/ appeared to be due to etch gas dissociation effects. Metal etching was believed to be limited by the removal of CCl/sub x/ and SiCl/sub x/ residues with CCl/sub 4/ and SiCl/sub 4/ and by etchant generation with BCl/sub 3/.

-12- (INSC)
AN - B83038847
TI - New dry etch for Al and Al-Cu-Si alloy: reactively masked sputter etching with SiF/sub 4/ (IN Appl. Phys. Lett. (USA))
AU - Horwitz, C.M.
CS - Res. Lab. of Electronics, MIT, Cambridge, MA, USA
SO - Appl. Phys. Lett. (USA), vol.42, no.10, PP.898-900, 15 May 1983, 6 REF.
JC - APPLAB
DT - J (JOURNAL PAPER)
NU - ISSN 00036951
CC - *B2550F
TC - ND (NEW DEVELOPMENTS); PR (PRACTICAL)
IT - aluminium; aluminium alloys; copper alloys; metallisation; silicon alloys; sputter etching
ST - dry etch; Al; Al-Cu-Si alloy; SiF/sub 4/; reactively masked sputter etching; SiF/sub 4//O/sub 2//H/sub 2/; photoresist masking layer
AB - A new technique, 'reactively masked sputter etching' of Al, is described here. This process can pattern fine lines in Al or in Al-Cu-Si alloy but does not have many of the problems associated with presently available reactive sputter etching methods. The technique combines deposition and etching in the one process; Al/sub 2/O/sub 3/; Al, and Al-Cu-Si alloy are etched, while all other materials are coated with a layer of SiO/sub x/. This results in essentially infinite (Al/mask) and (Al/substrate) etch rate ratios. In addition, the etch gas contains no Cl, which is a common cause of corrosion and undercut. In effect, the etch combines the advantages of both reactive and nonreactive sputter etching. The gas described here is a SiF/sub 4//O/sub 2/ mixture, and it is shown that additions of most impurity gases have very little effect on the etch. However, water or H/sub 2/ addition significantly improves the performance of the etch, and typical profiles are shown for a SiF/sub 4//O/sub 2//H/sub 2/ mixture with a photoresist masking layer.

-13- (INSC)
AN - B82014803
TI - Reactive ion etching induced corrosion of Al and Al-Cu films (IN Third Annual Microelectronics Measurement Technology Seminar Proceedings, San Jose, CA, USA, 17-18 March 1981)
AU - Lee, W.Y.; Chen, M.; Eldridge, J.M.; Schwartz, G.C.
CS - IBM Res. Lab., San Jose, CA, USA
SO - Benwill Publishing, Boston, MA, USA, 397 PP., PP.VIII/63-7, 1981, 5 REF.
DT - PA (CONFERENCE PAPER)
CC - *B2550E; B2570
TC - AP (APPLICATIONS); EX (EXPERIMENTAL)
IT - aluminium; aluminium alloys; copper alloys; corrosion protection; metallisation; sputter etching
ST - LSI processing; corrosion suppression; reactive ion induced corrosion; corrosion problem; Auger electron spectroscopy; AES; X-ray photoelectron spectroscopy; XPS; accelerated corrosion chamber; deionized water rinse; thermal oxidation treatment; corrosion resistance
AB - Al and Al-Cu lines generated by reactive ion etching (RIE) can corrode rapidly upon atmospheric exposure. In order for RIE to be a technologically viable process, this corrosion problem must be understood

ss l1 or ss 13

SS 15 RESULT (7)

SS 16?
d ab 7

TERM (D AB 7) NOT FOUND.
SS 16 RESULT (0)

SS 17?
prt fu 7

RECORDS SELECTED FROM SS 15.

-1- (JAPIO)
AN - 92-261018
TI - FABRICATING OF SEMICONDUCTOR DEVICE
PA - (2000029) OKI ELECTRIC IND CO LTD
IN - KOBAYASHI, MOTOKI; KANAMORI, JUN
PN - 92.09.17 J04261018, JP 04-261018
AP - 90.12.27 90JP-415118, 02-415118
SO - 93.01.28 SECT. E, SECTION NO. 1313; VOL. 17, NO. 47, PG. 3.
IC - H01L-021/302; H01L-021/027; H01L-021/304; H01L-021/3205
JC - 42.2 (ELECTRONICS--Solid State Components)
FKW - R004 (PLASMA)
AB - PURPOSE: To prevent corrosion and wiring failure from being produced by removing a resist after etching or carrying out cleaning processing by a solution for prevention of the corrosion, and thereafter carrying out gas plasma processing or heating processing of an exposed Al surface to be etched using mainly O(sub 2).
CONSTITUTION: A 1% Al 0.5% Si Cu film 3 is etched using BCl(sub 3), Cl(sub 2) mixed gas as chlorine gas. A substrate carried in a vacuum is ashed in a microwave ashing chamber. O(sub 2), CF(sub 4) mixed gas is used as ashing gas, and resist removal and chlorine substitution are simultaneously carried out. The substrate after ashed is returned to the air and is thereafter subjected to cleaning by an organic solvent release agent in order to remove a resist residue not yet removed. This is caused by a fact that since the resist residue on an Al pattern involves Cl, the residue involves Cl and hence reacts water in the air and is easy to produce rapid corrosion.

-2- (JAPIO)
AN - 92-015919

```
*SEARCHING.....
          OCCURS     TERM
           68595     AL
           49853     ALUMINUM:
              88     ALSI
               1     ALCUSI
               5     ALSICU
           29156     PLASMA:
            1650     RIE
           80815     ETCH:
           24135     SPUTTER:
            7215     CORONA:
            6146     GLOW:
          188919     DISCHARGE:
           13134     CL
             166     CL2
            8659     CHLORINE:
            2730     ANTICORR:
           40565     CORRO:
           22347     POST:
           17529     RESIDUE:
          100683     O
             322     O2
             164     O3
            5204     OZONE:
           44775     OXYGEN:
               5     H2O
          270242     WATER:
          132632     H
             880     H2
           52300     HYDROGEN:
               0     SPUTTER?
            1650     RIE
               0     ETCH?
               0     PLASMA?
               0     D AB
SS 1:  AL OR ALUMINUM: OR ALSI OR ALCUSI OR ALSICU  (108688)
SS 2:  PLASMA: OR RIE OR ETCH: OR SPUTTER: OR CORONA: OR GLOW: (3W)
  DISCHARGE:  (105843)
SS 3:  CL OR CL2 OR CHLORINE:  (21283)
SS 4:  ANTICORR: OR CORRO: OR POST: OR RESIDUE:  (77230)
SS 5:  O OR O2 OR O3 OR OZONE: OR OXYGEN:  (142344)
SS 6:  H2O OR WATER:  (265166)
SS 7:  1 (15W) 2  (4917)
SS 8:  3 AND 7 AND 4  (87)
SS 9:  5 AND 8  (21)
SS 10:  H OR H2 OR HYDROGEN:  (175076)
SS 11:  (  6 OR 10  ) AND 9  (5)
SS 12:  2 AND 5 AND 6 AND 10  (221)
SS 13:  12 AND (  (  ETCH? AND PLASMA?  ) OR SPUTTER? OR RIE  )  (2)
SS 14:  D AB  (0)

SS 15?
```

his

SS 1: AL OR ALUMINUM: OR ALSI OR ALCUSI OR ALSICU (123262)
SS 2: PLASMA: OR RIE OR ETCH: OR SPUTTER: OR CORONA: OR GLOW: (3W)
DISCHARGE: (111779)
SS 3: CL OR CL2 OR CHLORINE: (89314)
SS 4: ANTICORR: OR CORRO: OR POST: OR RESIDUE: (218779)
SS 5: O OR O2 OR O3 OR OZONE: OR OXYGEN: (277993)
SS 6: H2O OR WATER: (670357)
SS 7: SS 1 (15W) SS 2 (2809)
SS 8: SS 3 AND SS 7 AND SS 4 (43)
SS 9: SS 5 AND SS 8 (13)
SS 10: H OR H2 OR HYDROGEN: (403007)
SS 11: (SS 6 OR SS 10) AND SS 9 (4)
SS 12: SS 2 AND SS 5 AND SS 6 AND SS 10 (362)
SS 13: SS 12 AND ((ETCH? AND PLASMA?) OR SPUTTER? OR RIE) (1)
SS 14: D AB (0)

SS 15?
save etch

REPLACE OLD ETCH? ENTER YES OR A NEW SEARCHNAME.
yes

SAVE ETCH COMPLETED.
SS 15?
file japio

ELAPSED TIME ON WPAT: 0.28 HRS.
$33.32 EST COST CONNECT TIME.
$4.00 EST COST ONLINE PRTS: 5
$37.32 EST TOTAL COST THIS WPAT SESSION.

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COVERS PATENT APPLICATIONS FROM OCT 1976 THRU DEC 1992 (9307)

SS 1?
recall etch

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**********  Welcome to STN International  **********

 NEWS  1    STN Workshop Information, N. America (Updated Jun 15)
 NEWS  2    Pricing Options for CAS Files
 NEWS  3    FREE offer in a New File -- ABI-INFORM
 NEWS  4    Two New Fields Added to CHEMLIST
 NEWS  5    Adjustments to CHEMLIST Fees in June
 NEWS  6    ENERGIE No Longer Updated
 NEWS  7    CA File AN Search Fee Reinstated
 NEWS  8    FREE STN User Meeting at ACS in Chicago
 NEWS  9    BEILSTEIN Enhancements
 NEWS 10    News Source Added to IMOBILITY
 NEWS 11    New Materials Database--METALCREEP

 NEWS  HOURS  STN Operating Hours Plus Help Desk Availability
 NEWS  LOGIN  Welcome Banner and News Items
 NEWS  INTER  General Internet Information

For a complete list of news messages, type "NEWS" at an arrow prompt.
**************** STN  Columbus ****************
FILE 'HOME' ENTERED AT 10:42:54 ON 26 JUL 93

=) file reg
COST IN U.S. DOLLARS                        SINCE FILE      TOTAL
                                               ENTRY    SESSION
FULL ESTIMATED COST                             0.27       0.27

FILE 'REGISTRY' ENTERED AT 10:43:02 ON 26 JUL 93
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STRUCTURE FILE UPDATES:  24 JUL 93   HIGHEST RN 148905-00-4
DICTIONARY FILE UPDATES: 25 JUL 93   HIGHEST RN 148905-00-4

=) s hydrogen/cn
L1          1 HYDROGEN/CN

=) s aluminum/nc
NUMERIC VALUE NOT VALID 'ALUMINUM'
Numeric values may contain 1-8 significant figures.  If range notation
is used, both the beginning and the end of the range must be
specified, e.g., '250-300/MW'.  Expressions such as '250-/MW' are not
allowed.  To search for values above or below a given number, use the
), =), (, or (= operators, e.g., 'MW =) 250'.  Text terms cannot be
used in numeric expressions.  If you specify a unit, it must be
dimensionally correct for that field code.  To see the unit
designations for field codes in the current file, enter "DISPLAY UNIT
ALL" at an arrow prompt (=)).

=)
```

s hydrogen/cn

L2 1 HYDROGEN/CN

=) s oxygen/cn or ozone/cn
1 OXYGEN/CN
1 OZONE/CN
L3 2 OXYGEN/CN OR OZONE/CN

=) s water/cn
L4 1 WATER/CN

=) file ca
COST IN U.S. DOLLARS SINCE FILE ENTRY TOTAL SESSION
FULL ESTIMATED COST 15.07 15.34

FILE 'CA' ENTERED AT 10:44:03 ON 26 JUL 93

FILE COVERS 1967 - 24 Jul 93 (930724/ED) VOL 119 ISS 4.
For OFFLINE Prints or Displays, use the ABS or ALL formats to obtain abstract graphic structures. The AB format DOES NOT display structure diagrams.

=)

s (etch? or rie or plasma? or sputter? or corona? or glow?(3w)discharge?)/bi,ab

66900 ETCH?/AB
212 RIE/BI
696 RIE/AB
235944 PLASMA?/BI
323742 PLASMA?/AB
32852 SPUTTER?/BI
39679 SPUTTER?/AB
15507 CORONA?/BI
30142 CORONA?/AB
7534 GLOW?/BI
13785 GLOW?/AB
45754 DISCHARGE?/BI
103067 DISCHARGE?/AB
11436 GLOW?(3W)DISCHARGE?

W)DISCHARGE?)/BI,AB

```
=) d his

     (FILE 'HOME' ENTERED AT 10:42:54 ON 26 JUL 93)

     FILE 'REGISTRY' ENTERED AT 10:43:02 ON 26 JUL 93
L1             1 S HYDROGEN/CN
L2             1 S HYDROGEN/CN
L3             2 S OXYGEN/CN OR OZONE/CN
L4             1 S WATER/CN

     FILE 'CA' ENTERED AT 10:44:03 ON 26 JUL 93
L5        506819 S (ETCH? OR RIE OR PLASMA? OR SPUTTER? OR CORONA? OR GLOW

=)
```

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file reg
COST IN U.S. DOLLARS                    SINCE FILE      TOTAL
```

	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	15.93	31.27

FILE 'REGISTRY' ENTERED AT 10:45:41 ON 26 JUL 93
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STRUCTURE FILE UPDATES: 24 JUL 93 HIGHEST RN 148905-00-4
DICTIONARY FILE UPDATES: 25 JUL 93 HIGHEST RN 148905-00-4

=) s aluminum/cn
L6 1 ALUMINUM/CN

=) file ca

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	3.26	34.53

FILE 'CA' ENTERED AT 10:45:56 ON 26 JUL 93
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FILE COVERS 1967 - 24 Jul 93 (930724/ED) VOL 119 ISS 4.
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=) s l5(15w)l6
155292 L6
L7 0 L5(15W)L6

=) d his

(FILE 'HOME' ENTERED AT 10:42:54 ON 26 JUL 93)

FILE 'REGISTRY' ENTERED AT 10:43:02 ON 26 JUL 93
L1 1 S HYDROGEN/CN
L2 1 S HYDROGEN/CN
L3 2 S OXYGEN/CN OR OZONE/CN
L4 1 S WATER/CN

FILE 'CA' ENTERED AT 10:44:03 ON 26 JUL 93
L5 506819 S (ETCH? OR RIE OR PLASMA? OR SPUTTER? OR CORONA? OR GLOW

FILE 'REGISTRY' ENTERED AT 10:45:41 ON 26 JUL 93
L6 1 S ALUMINUM/CN

FILE 'CA' ENTERED AT 10:45:56 ON 26 JUL 93
L7 0 S L5(15W)L6

=)

s l5 and l6 and l2 and l3

143780 L2
175755 L3
L8 115 L5 AND L6 AND L2 AND L3

=)

s l2 and l3 and l4 and l5

175755 L3
149715 L4
L9 184 L2 AND L3 AND L4 AND L5

=) s l8 and l9
L10 12 L8 AND L9

=) d ti 1-12

L10 ANSWER 1 OF 12 COPYRIGHT 1993 ACS
TI Photon stimulated desorption of neutral species from aluminum

L10 ANSWER 2 OF 12 COPYRIGHT 1993 ACS
TI ***Plasma*** cleaning of beamline optical components: contamination and gas composition effects

L10 ANSWER 3 OF 12 COPYRIGHT 1993 ACS
TI A comparison between analytical methods for zinc specimens exposed in a rural atmosphere

L10 ANSWER 4 OF 12 COPYRIGHT 1993 ACS
TI Removal of impurities from rod-in-tube-type optical fiber preforms

L10 ANSWER 5 OF 12 COPYRIGHT 1993 ACS
TI Removal of impurities from tubular optical fiber preforms

L10 ANSWER 6 OF 12 COPYRIGHT 1993 ACS
TI A method of ***etching*** a sample of aluminum-containing material

L10 ANSWER 7 OF 12 COPYRIGHT 1993 ACS
TI A trace gas mass spectrometer for on-line monitoring of ***sputter*** processes at 10-2 mbar without pressure reduction

L10 ANSWER 8 OF 12 COPYRIGHT 1993 ACS
TI Increasing corrosion resistance of metals and alloys

L10 ANSWER 9 OF 12 COPYRIGHT 1993 ACS
TI Wall conditioning of TEXTOR

L10 ANSWER 10 OF 12 COPYRIGHT 1993 ACS
TI Chemical analyses of sol/gel surfaces and thin films

L10 ANSWER 11 OF 12 COPYRIGHT 1993 ACS
TI Corrosion phenomena in metal-encapsulated tin-plated transistors

L10 ANSWER 12 OF 12 COPYRIGHT 1993 ACS
TI The effects of gas composition on discharge and deposition characteristics when magnetron ***sputtering*** aluminum

=)

d ab 2,6,8,11

L10 ANSWER 2 OF 12 COPYRIGHT 1993 ACS

AB A program was initiated to study the impact [redacted]as compn. on the C removal rate during ***plasma*** cleaning of optical components, and of possible contamination due to the ***plasma*** processing. The measurements were performed in a test chamber designed to simulate the geometry of the grating/Codling mirror section of a Grasshopper monochromator. Removal rates were detd. for a d.c. (Al electrode) discharge using a quartz crystal microbalance coated with poly(Me methacrylate), located at the position of the grating. Auger electron spectroscopy anal. of strategically located, Au-coated stainless steel samples was employed to det. contamination. The relative removal rates of the gases studied were 3% C2F6/O2 .mchgt. O2 + H2O) O2 .apprx. N2O) H2) N2. Although the C2F6/O2 gas mixt. showed a 20 times greater removal rate than its nearest competitor, it also caused significant contamination to occur. Contamination studies were performed for both d.c. and radio-frequency (rf) discharges. For the d.c. discharge great care must be taken in order to avoid Al contamination; for the rf discharge, significant Fe contamination was obsd.

L10 ANSWER 6 OF 12 COPYRIGHT 1993 ACS

AB A post- ***etch*** treatment method is provided which is capable of imparting high corrosion prevention performance to Al-contg. wiring films. The sample of Al-contg. wiring material that is ***etched*** using the halogen-type gas is treated with the ***plasma*** of a gas that has an O component, and the resist formed on the Al-contg. wiring material is reacted with O and is removed. Further, a ***plasma*** is generated using a gas having a H component or this gas is liquefied into droplets thereof on the sample surface, so that halogen components (Cl, Br, etc.) adhered to the Al-contg. wiring material through the ***etching*** treatment are reacted with H and are effectively removed in the form of HCl or HBr.

L10 ANSWER 8 OF 12 COPYRIGHT 1993 ACS

AB For increased corrosion resistance, metals and alloys are exposed for 1 s-10 min to a cold ***plasma*** at 1-103 Pa and 100-5000 V in an atm. contg. O2, O3, N2, H2, air, CO2, CO, N oxide, H2O(g), combustion gas, and/or neutral gas. Thus, 17% Co ferritic stainless steel was subjected to ***plasma*** treatment for 4 min at 103 Pa, 100 mA, and 250 V by using a N-20% O mixt. The treated specimen exposed to a soln. contg. 28% FeCl3 17, HCl 2.5, H2O 188.5 mL, and NaCl 5 g showed no corrosion attack. The untreated specimen exposed to Ar was strongly corroded.

L10 ANSWER 11 OF 12 COPYRIGHT 1993 ACS

AB The corrosion in Ni encapsulated Sn-plated Si transistors was studied after) 10000 h operation at 40.degree.. Corrosion affects current-voltage properties. Corrosion occurs at the Au-plated base plate near the semiconductor, on the glass coating of the base plate, on the Al wires, and on the base and emitter region Al contacts. This corrosion is essentially due to electrodiffusion of ions on the glass and semiconductor and partly due to HCl or KCl ***etching*** , and anodization of the metal particles of the base plate. The corrosion is caused by H2O produced by reaction of H from the Sn plate and O2 trapped in the casing. It is prevented by using N2 instead of air during the processing.

=)

d all 6

L21 ANSWER 37 OF 46 COPYRIGHT 1993 ACS

AN CA96(14):108528z

TI The effects of gas composition on discharge and deposition characteristics when magnetron ***sputtering*** aluminum

AU Nyaiesh, A. R.; Holland, L.

CS Unit Plasma Mater. Process., Univ. Sussex

LO Falmer/Sussex, UK

SO Vacuum, 31(8-9), 371-5

SC 56-6 (Nonferrous Metals and Alloys)

DT J

CO VACUAV

IS 0042-207X

PY 1981

LA Eng

AB A study was made to det. the effects of H_2O, O, and H in an Ar-discharge when ***sputtering*** Al in a tunnel field planar magnetron. The Al cathode (99.999%) was water-cooled and 75 mm diam. with a ***sputtering*** track defined by the magnetic field (560 G) of 55 mm diam. and 10 mm width. Deposition rate was detd. from frequency change of an hf crystal mounted 60 mm from the cathode. The discharge current I as a function of the applied voltage V rose rapidly at low voltage when H_2O(g) was in transition to a higher voltage characteristic curve as the equil. oxide covering on the cathode becaoe negligible from ***sputtering*** . Depending on the power input, addn. of sufficient O or H to the Ar discharge resulted in the prodn. of either the oxide or the clean metal V/I curve, resp. Films grown under the oxidized cathode regime were reactively ***sputtered*** Al_2O_3. The transition between the metal and oxide discharges and deposition characteristics were early reported for Al ***sputtering*** in ht discharge but they were more easily obsd. in a magnetron because of the high ***sputtering*** power consequent on the discharge localization and degree of ionization. The ratio of the film thickness growth rate for equal power input into the magnetron were 27:1 for Al to Al_2O_3, which is in reasonable agreement for the growth ratio previously reported for rf magnetron films.

KW aluminum magnetron ***sputtering*** gas compn

IT ***Sputtering***
(of aluminum, gas compn. effect on)

IT ***1333-74-0*** , uses and miscellaneous ***7732-18-5*** , vapor ***7782-44-7*** , uses and miscellaneous
(aluminum magnetron ***sputtering*** in relation to)

IT 7440-37-1, uses and miscellaneous
(discharge, ***sputtering*** of aluminum in magnetron field in relation to)

IT 1344-28-1P, preparation
(formation of, in aluminum magnetron ***sputtering***)

IT 7429-90-5, properties
(***sputtering*** of, in magnetron, gas compn. effect on)

=> d his

[illegible] ENTERED AT 09:40:53 ON 26 JUL 93

L1 1 S HYDROGEN/CN

[illegible] 6 S HYDROGEN/CN OR OZONE/CN

[illegible] FILE [illegible] 26 JUL 93

L3 [illegible] S L1 AND L2

[illegible] FILE [illegible] 26 JUL 93

L5 [illegible] S L3 AND L4

L6 [illegible] S L1 AND L2 AND L3

L7 48 S (PLASMA? OR SPUTTER?) OR (PLASMA? AND ETCH?))/BI,AB AND L9

=> log y

COST IN U.S. DOLLARS SINCE FILE ENTRY 6.46 SESSION 6.36

FULL ESTIMATED COST (FOR QUALIFYING ACCOUNTS) SINCE FILE ENTRY 461.88 TOTAL SESSION

STN INTERNATIONAL LOGOFF AT 11:08:42 ON 26 JUL 93

TYMNET: call cleared by request

please log in:

L20 ANSWER 1 OF 9 COPYRIGHT 1993 ACS
AN CA117(8):81729d
TI Manufacture of semiconductor device by dry ***etching***
AU Ioka, Satoshi
CS Mitsubishi Denki K. K.
LO Japan
SO Jpn. Kokai Tokkyo Koho, 3 pp.
PI JP 04082218 A2 16 Mar 1992 Heisei
AI JP 90-198267 24 Jul 1990
IC ICM H01L021-302
ICS H01L021-28; H01L021-44
SC 76-3 (Electric Phenomena)
DT P
CO JKXXAF
PY 1992
LA Japan
AB In the manuf. of the device by dry ***etching*** of an Al wiring with Cl-contg. gas, ***anticorrosion*** treatment is done using H or H-CnFn mixed gas. The ***anticorrosion*** treatment was done without exposure of the Al wiring.
KW semiconductor device aluminum wiring ***etching***
IT Semiconductor devices
(aluminum wiring in, ***anticorrosion*** treatment in dry ***etching*** of)
IT ***Sputtering***
(***etching*** , ion-beam, ***anticorrosion*** treatment in, in manuf. of semiconductor device)
IT ***Etching***
(***sputter*** , ion-beam, ***anticorrosion*** treatment in, in manuf. of semiconductor device)
IT ***1333-74-0*** , Hydrogen, uses 13708-79-7, Curium fluoride (CmF3)
(***anticorrosion*** treatment with, in dry ***etching*** of semiconductor device aluminum wiring)
IT ***7782-50-5*** , Chlorine, uses
(dry ***etching*** gas contg., in manuf. of semiconductor device with aluminum wiring)
IT ***7429-90-5*** , Aluminum, uses
(wiring, in semiconductor device, by dry ***etching***)

=)

L10 ANSWER 6 OF 12 COPYRIGHT 1993 ACS
AN CA114(26):258210u
TI A method of ***etching*** a sample of a[illegible]num-containing material
AU Fukuyama, Ryooji; Kakehi, Yutaka; Nawata, Makoto; Kawahara, Hironobu; Sato, Yoshiaki; Torii, Yoshimi; Kawaraya, Akira; Sato, Yoshie
CS Hitachi, Ltd.
LO Japan
SO Eur. Pat. Appl., 15 pp.
PI EP 416774 A1 13 Mar 1991
DS R: DE, FR, GB
AI EP 90-309106 20 Aug 1990
PRAI JP 89-218523 28 Aug 1989
JP 89-284711 2 Nov 1989
JP 90-117596 9 May 1990
IC ICM H01L021-321
SC 76-11 (Electric Phenomena)
DT P
CO EPXXDW
PY 1991
LA Eng
AB A post- ***etch*** treatment method is provided which is capable of imparting high corrosion prevention performance to Al-contg. wiring films. The sample of Al-contg. wiring material that is ***etched*** using the halogen-type gas is treated with the ***plasma*** of a gas that has an O component, and the resist formed on the Al-contg. wiring material is reacted with O and is removed. Further, a ***plasma*** is generated using a gas having a H component or this gas is liquefied into droplets thereof on the sample surface, so that halogen components (Cl, Br, etc.) adhered to the Al-contg. wiring material through the ***etching*** treatment are reacted with H and are effectively removed in the form of HCl or HBr.
KW aluminum wiring ***plasma*** ***etching***
IT Halogens
(in ***plasma*** ***etching*** of aluminum-contg. material)
IT Resists
(removal of, by oxygen treatment, after ***plasma*** ***etching*** of aluminum-contg. material)
IT Electric conductors
(wiring, aluminum-contg., ***plasma*** ***etching*** of)
IT ***Sputtering***
(***etching*** , of aluminum-contg. material)
IT ***Etching***
(***sputter*** , of aluminum-contg. material)
IT 64-17-5, Ethanol, uses and miscellaneous 67-56-1, Methanol, uses and miscellaneous 67-64-1, Acetone, uses and miscellaneous 74-82-8, Methane, uses and miscellaneous ***1333-74-0*** , Hydrogen, uses and miscellaneous ***7732-18-5*** , Water, vapor 7782-41-4, Fluorine, uses and miscellaneous ***7782-44-7*** , Oxygen, uses and miscellaneous 10024-97-2, Nitrogen oxide (N2O), uses and miscellaneous ***10028-15-6*** , Ozone, uses and miscellaneous
(in ***plasma*** ***etching*** of aluminum-contg. material)
IT ***7429-90-5*** , Aluminum, reactions
(***plasma*** ***etching*** of)

=)

=> d his 07-743,382

(FILE 'USPAT' ENTERED AT 17:47:25 ON 27 AUG 92)
SET PAGELENGTH 19

L1 56198 S ETCH? OR RIE OR GLOW? DISCHARGE?
L2 137119 S CL OR BR OR CHLORINE? OR BROMINE?
L3 202498 S O(2W)2 OR OXYGEN?
L4 29054 S ASH?
L5 148018 S WATER?(3A)VAPOR? OR H(2W)2
L6 2233 S L1(P)L2
L7 574371 S RESIST? OR MASK? OR PHOTORESIST?
L8 2122 S L4(P)L7
L9 436 S (L3 OR L5)(P)L8
L10 102 S L6 AND L9

FILE 'JPOABS' ENTERED AT 18:15:40 ON 27 AUG 92
L11 18945 S CL OR BR OR CHLORINE? OR BROMINE?
L12 50959 S ETCH? OR RIE OR GLOW? DISCHARGE?
L13 3150 S H(2W)O OR WATER?(3A)VAPOR?
L14 45598 S O(2W) 2 OR OXYGEN?
L15 5016 S ASH?
L16 295163 S RESIST? OR PHOTORESIST? OR MASK?
L17 233 S L11 AND L12 AND (L13 OR L14)
L18 5 S L11 AND L12 AND L13 AND L14
L19 2507 S H(W)(SUB)(W)2(W)O OR WATER?(3A)VAPOR?
L20 4 S L19 AND L11 AND L12
L21 231 S L14 AND L11 AND L12
L22 38343 S (PLASMA? OR NEUTRAL?)
L23 119 S L21 AND L22
L24 1 S NEUTRAL? AND PLASMA? AND L21

07-743,383

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      (FILE 'USPAT' ENTERED AT 16:23:54 ON 05 SEP 92)
                SET PAGELENGTH 19
                SET LINELENGTH 78

      FILE 'JPOABS' ENTERED AT 16:24:17 ON 05 SEP 92
L1              2 S 56131930/PN OR 58132937/PN OR 01241126/PN
L2              2 S 58132937/PN OR L1

      FILE 'JPOABS' ENTERED AT 16:27:59 ON 05 SEP 92
L3          47827 S ETCH? OR RIE
L4          48207 S (AL AND CU) OR (ALUMINUM? OR COPPER?)
05 SEP 92 17:03:23              U.S. Patent & Trademark Office            P0131
L5          29536 S (TI OR TIN OR WSI OR TISI OR MOSI)
L6          23069 S (TITANIUM? OR TUNGSTEN? OR MOLYBDENUM?)
L7          15995 S CL OR CHLORINE?
L8             29 S L3 AND L4 AND (L5 OR L6) AND L7
L9           5804 S SUBLIME? OR VAPORIZE?
L10          1230 S ALUMINUM?(3W)(HALIDE? OR CHLORIDE? OR IODIDE? OR FLUORIDE?
L11          2494 S ALF OR ABR OR ACL OR AI OR L10
L12         25264 S RIE OR PLASMA? OR REACTIVE ION?
L13           211 S L9 AND L12
L14             0 S L11 AND L13
L15            16 S SUBLIME? AND L13

      FILE 'USPAT' ENTERED AT 16:56:26 ON 05 SEP 92
L16          4106 S SUBLIME?
L17         41020 S RIE OR REACTIVE ION? OR PLASMA?
L18            25 S L16(P)L17
05 SEP 92 17:03:35              U.S. Patent & Trademark Office            P0132
L19          7724 S 156/345,643/CCLR
L20             1 S L18 AND L19
L21            24 S L18 NOT L20
L22             0 S TI CCLS 1-24
L23            24 S L21

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=>
```

- METHOD OF POST TREATMENT
- (2000510) HITACHI LTD
- SATO, HITOAKI; FUKUYAMA, RYOJI; KAWARAYA, AKIRA; TANAKA, YOSHIE
- 92.01.21 J04015919, JP 04-15919
- 90.05.09 90JP-117596, 02-117596
- 92.04.23 SECT. E, SECTION NO. 1194; VOL. 16, NO. 170, PG. 52.
- H01L-021/302
- 42.2 (ELECTRONICS--Solid State Components)
W - R004 (PLASMA)
- PURPOSE: To provide an Al wiring film with a high corrosion-proof performance by removing resist with oxygen plasma and removing residual deposit with plasma containing at least a hydrogen component in post treatment after an al wiring is etched.
CONSTITUTION: A microwave generated by a microwave generator 1 is introduced into a treatment chamber 12 via a microwave guide tube 2 and a quartz window 3, post-treatment gas controlled by a gas flow rate control valve 9 is introduced into the treatment chamber 12 though a gas introduction port 8, and a pressure regulation valve 5 regulates the pressure in the treatment chamber 12. The introduced microwave converts the post-treatment gas into plasma. After a resist component is removed only with O(sub 2) plasma, O(sub 2), O(sub 3), inert gas or N(sub 2)O gas, and methanol having a hydrogen radical are mixed and plasma- treated and a chlorine component attached to the sidewalls of an Al wiring is removed to prevent an Al wiring film form corroding.

(JAPIO)
- 91-280535
- DRY ETCHING DEVICE

07-743,383

```
TERMINAL (ENTER 1, 2, 3, OR ?):3

* * * * * * * * * *   Welcome to STN International   * * * * * * * * * *

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 ///                  29 due to file maintenance.                    ///

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                                                           ENTRY     SESSION
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STRUCTURE FILE UPDATES:  21 AUG 92   HIGHEST RN 143119-61-3
DICTIONARY FILE UPDATES: 28 AUG 92   HIGHEST RN 143119-61-3


=> s oxygen/cn
L1             1 OXYGEN/CN

=> s chlorine/cn
L2             1 CHLORINE/CN

=> s bromine/cn
L3             1 BROMINE/CN

=> s water vapor/cn or steam/cn
               0 WATER VAPOR/CN
               0 STEAM/CN
L4             0 WATER VAPOR/CN OR STEAM/CN

=> s water/cn
L5             1 WATER/CN

=> file ca
COST IN U.S. DOLLARS                                    SINCE FILE      TOTAL
                                                           ENTRY     SESSION
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FILE COVERS 1967 - 23 Aug 92 (920823/ED) VOL 117 ISS 08.
For OFFLINE Prints or Displays, use the ABS or ALL formats to obtain abstract graphic structures. The AB format DOES NOT display structure diagrams.

```
=> s (etch? or rie or glow?(3w)discharge?)/bi,ab
         33439 ETCH?/BI
         62624 ETCH?/AB
           186 RIE/BI
           633 RIE/AB
          7230 GLOW?/BI
         13241 GLOW?/AB
         43800 DISCHARGE?/BI
         98834 DISCHARGE?/AB
         10963 GLOW?(3W)DISCHARGE?
L6       78268 (ETCH? OR RIE OR GLOW?(3W)DISCHARGE?)/BI,AB

=> s (corrosion? or anticorrosion? or post-treat? or posttreat?)/bi,ab
        106179 CORROSION?/BI
        110574 CORROSION?/AB
          3342 ANTICORROSION?/BI
          1804 ANTICORROSION?/AB
         13039 POST/BI
        395419 TREAT?/BI
           703 POST-TREAT?/BI
                 ((POST(W)TREAT?)/BI)
         43612 POST/AB
       1076949 TREAT?/AB
          2559 POST-TREAT?/AB
                 ((POST(W)TREAT?)/AB)
           323 POSTTREAT?/BI
          2305 POSTTREAT?/AB
L7      147152 (CORROSION? OR ANTICORROSION? OR POST-TREAT? OR POSTTREAT?
               )/BI,AB

=> s (cl or chlorine? or br or bromine?)/bi,ab
          5888 CL/BI
        251193 CL/AB
         45840 CHLORINE?/BI
          4978 CHLORINE?/AB
          3289 BR/BI
        111274 BR/AB
         18942 BROMINE?/BI
          2087 BROMINE?/AB
L8      336796 (CL OR CHLORINE? OR BR OR BROMINE?)/BI,AB

=> s (oxygen?)/bi,ab
        224620 (OXYGEN?)/BI
         48268 (OXYGEN?)/AB
L9      251815 (OXYGEN?)/BI,AB

=> s (steam? or water?(3w)vapor?)/bi,ab
         28462 STEAM?/BI
         65241 STEAM?/AB
        494393 WATER?/BI
        689766 WATER?/AB
        105048 VAPOR?/BI
        161354 VAPOR?/AB
         26897 WATER?(3W)VAPOR?
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L10          97020 (STEAM? OR WATER?(3W)VAPOR?)/BI,AB

=> d his

     (FILE 'HOME' ENTERED AT 15:31:50 ON 28 AUG 92)

     FILE 'REGISTRY' ENTERED AT 15:32:05 ON 28 AUG 92
L1             1 S OXYGEN/CN
L2             1 S CHLORINE/CN
L3             1 S BROMINE/CN
L4             0 S WATER VAPOR/CN OR STEAM/CN
L5             1 S WATER/CN

     FILE 'CA' ENTERED AT 15:33:29 ON 28 AUG 92
L6         78268 S (ETCH? OR RIE OR GLOW?(3W)DISCHARGE?)/BI,AB
L7        147152 S (CORROSION? OR ANTICORROSION? OR POST-TREAT? OR POSTTRE
L8        336796 S (CL OR CHLORINE? OR BR OR BROMINE?)/BI,AB
L9        251815 S (OXYGEN?)/BI,AB
L10        97020 S (STEAM? OR WATER?(3W)VAPOR?)/BI,AB

=> s (l1 or l9) and (l2 or )3 or l8) and l6 and l7
        147883 L1
         28298 L2
         14482 L3
L11         22 (L1 OR L9) AND (L2 OR L3 OR L8) AND L6 AND L7

=> s (l5 or l10) and l11
        141695 L5
L12          3 (L5 OR L10) AND L11

=> d bi,pi,ab 1-3
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=> d all 1-3

L12  ANSWER 1 OF 3  COPYRIGHT 1992 ACS
AN   CA115(22):246939w
TI   A comparison between analytical methods for zinc specimens exposed
     in a rural atmosphere
AU   Odnevall, I.; Leygraf, C.
CS   Dep. Appl. Electrochem., R. Inst. Technol.
LO   Stockholm S-104 05, Swed.
SO   Proc. - Electrochem. Soc., 91-7(Proc. Symp. Appl. Surf. Anal.
     Methods Environ./Mater. Interact., 1990), 507-23
```

SA 20, 72
DT J
CO PESODO
IS 0161-6374
PY 1991
LA Eng
AB The aim of this work is to explore the possible use of different methods for analyzing corroded zinc specimens exposed under sheltered and unsheltered conditions in a rural environment for 5 yrs. X-ray powder diffraction with a Guinier-Hagg camera showed the presence of (Zn,Cu)4SO4(OH)6.4H2O (naumwite) and SiO2 (low quartz) on the sheltered sample and Zn5(CO3)2(OH)6 (hydrozincite) on the unsheltered sample. Naumwite has not previously been reported as a corrosion product on zinc whereas hydrozincite commonly occurs in different kinds of atmospheres. To provide further information a no. of other methods were used for anal. of corrosion products on the same zinc specimens. The methods included in this work are: x-ray powder diffraction, Fourier-transform IR spectrometry and thermogravimetry for phase anal., glow discharge optical spectroscopy, SEM with x-ray microanal., x-ray fluorescence spectroscopy, XPS and secondary-ion mass spectroscopy for elemental anal., and finally ion chromatog. for detn. of water sol. anions. Among less established anal. methods in the field of atm. corrosion this comparison shows that glow discharge optical spectroscopy and ion chromatog. can provide valuable complementary information to more established methods such as x-ray powder diffraction and SEM.
KW zinc corrosion product analysis method comparison; thermogravimetry zinc corrosion; naumwite formation zinc corrosion; secondary ion mass spectrometry zinc corrosion; hydrozincite formation zinc corrosion; IR spectrometry zinc corrosion; x ray diffraction analysis zinc corrosion; scanning x ray microanalysis zinc corrosion; XPS zinc corrosion; glow discharge optical spectroscopy zinc corrosion; ion chromatog zinc corrosion; fluorescence x ray zinc corrosion; SIMS zinc corrosion
IT 7440-66-6, Zinc, reactions
(corrosion of, comparison of anal. methods for study of)
IT 14798-03-9, Ammonium, analysis
(detection of, in zinc exposed in rural atm. by XPS)
IT 338-70-5, analysis 14797-55-8, Nitrate, analysis 16887-00-6, Chloride, analysis
(detection of, in zinc exposed in rural atm. by ion chromatog.)
IT 3812-32-6, Carbonate, analysis ***7732-18-5*** , Water, analysis 14260-30-9, Hydroxide, analysis 14808-79-8, Sulfate, analysis
(detection of, on zinc exposed in rural atm., comparison of methods for)
IT 7440-44-0, Carbon, analysis 7440-50-8, Copper, analysis 7704-34-9, Sulfur, analysis ***7782-44-7*** , Oxygen, analysis
(detn. of depth and lateral profiles and content of, in zinc exposed in rural atm., comparison of methods for)
IT 1333-74-0, Hydrogen, analysis
(detn. of depth profile of, in zinc exposed in rural atm. by glow discharge optical spectroscopy)
IT 7439-92-1, Lead, analysis 7440-23-5, Sodium, analysis
(detn. of depth profile of, in zinc exposed in rural atm. by glow-discharge optical spectroscopy)
IT 7440-21-3, Silicon, analysis
(detn. of depth profile of, in zinc exposed in rural atm. by glow-discharge optical spectroscopy and SIMS)
IT 7439-89-6, Iron, analysis 7440-09-7, Potassium, analysis
(detn. of, in zinc exposed in rural atm. by SIMS and x-ray fluorescence)
IT 7429-90-5, Aluminum, analysis ***7782-50-5*** , Chlorine, analysis
(detn. of, in zinc exposed in rural atm., comparison of methods for)
IT 7723-14-0, Phosphorus, analysis
(detn. of, in zinc exposed in world atm by x-ray fluorescence)
IT 5263-02-5 7631-86-9, Silica, analysis 7631-86-7
(identification of, on zinc sheltered rural atm., comparison of methods for)

07-743383

d all 9,10

Ø2-213138 Aug. 24, 1990 L8: 9 of 29
MANUFACTURE OF SEMICONDUCTOR DEVICE

INVENTOR: SETSUO WAKE
ASSIGNEE: MITSUBISHI ELECTRIC CORP, et al. (10)
APPL NO: Ø1-34357
DATE FILED: Feb. 14, 1989
PATENT ABSTRACTS OF JAPAN
Ø5 SEP 92 16:43:27 U.S. Patent & Trademark Office P0054

Ø2-213138 Aug. 24, 1990 L8: 9 of 29
MANUFACTURE OF SEMICONDUCTOR DEVICE

ABS GRP NO: E0999
ABS VOL NO: Vol. 14, No. 511
ABS PUB DATE: Nov. 8, 1990
INT-CL: H01L 21*3205; H01L 21*28

ABSTRACT:

PURPOSE:To make it possible to realize aluminum wiring which used a barrier metal film wherein aluminum corrosion hardly occurs by forming an Al film through a thin insulating film on a barrier metal film and patterning the Al film and the barrier metal film, and then breaking the insulation of said insulating film and sintering the Al film and the barrier metal film.
Ø5 SEP 92 16:43:37 U.S. Patent & Trademark Office P0055

Ø2-213138 Aug. 24, 1990 L8: 9 of 29
MANUFACTURE OF SEMICONDUCTOR DEVICE

CONSTITUTION:A high melting point metallic film 1 such as Ti, TiN, TiW, etc., to become a barrier metal is formed on an interlayer insulating film formed on a semiconductor substrate, and thereon a relatively weak insulating film 4 whose insulation breakdown strength is about 10V is formed thin by a vapor growth method, etc., and thereon an Al film 2 is formed. Next, with a photoresist 3 formed in a desired shape as a mask, the Al film 2 and the barrier metal film 1 are etched by RIE method which uses reactive gas containing Cl.sub.2, etc., and then the photoresist 3 is removed. Next, by charging the surface of the Al film 2 with currents by ion beam irradiation, etc., the insulation of the insulating film 4 is broken, and then by proper heat treatment the Al film 2 and the barrier metal film 3 are sintered so as to get electrical connection between the Al film 2 and the
Ø5 SEP 92 16:43:51 U.S. Patent & Trademark Office P0056

Ø2-213138 Aug. 24, 1990 L8: 9 of 29
MANUFACTURE OF SEMICONDUCTOR DEVICE

barrier metal 1.f

Ø2-206121 Aug. 15, 1990 L8: 10 of 29
WIRING STRUCTURE OF SEMICONDUCTOR ELEMENT

INVENTOR: MASAHARU SAIKAI
ASSIGNEE: HITACHI LTD, et al. (60)
APPL NO: Ø1-25791
DATE FILED: Feb. 6, 1989

02-206121 Aug. 15, 1990 L8: 10 of 29
WIRING STRUCTURE OF SEMICONDUCTOR ELEMENT

ABS PUB DATE: Oct. 29, 1990
INT-CL: H01L 21*3205

ABSTRACT:

PURPOSE:To prevent Al from being corroded by a local battery action between different kinds of metals by a method wherein an interface between the different kinds of metals of a laminated wiring part is not exposed to the air side.

CONSTITUTION:In a structure in which (a) to (c) faces of a barrier metal 1 coming into direct contact with a lower-layer wiring part and a substrate are

02-206121 Aug. 15, 1990 L8: 10 of 29
WIRING STRUCTURE OF SEMICONDUCTOR ELEMENT

covered with an Al alloy 2, a high-meltingpoint metal or an alloy of high- melting-point metals such as, e.g., TiN, W, TiW, MoSi, WSi or the like is used as a material for the barrier metal 1 and a metal using Al as a base metal such as Al-Cu, Al-Cu-Si, Al-Pd-Si or the like is used as a material for the Al alloy 2. Thereby, a contact interface between the barrier metal 1 and the Al alloy 2 is not exposed to the air; this is effective in preventing the Al from being corroded by a hydrogen-generating-type local battery action which is caused by a residue of a chlorine component used in a dry etching operation of the Al alloy 2.d

=>

d all 6-7

63-4842 Jan. 9, 1988 L15: 6 of 16
METHOD FOR CONTROLLING SYNTHESIS OF HYPER FINE POWDER BY PLASMA REACTION

INVENTOR: RYOJI SEDAKA, et al. (2)
ASSIGNEE: FURUKAWA ELECTRIC CO LTD:THE
APPL NO: 61-148639
DATE FILED: Jun. 25, 1986
PATENT ABSTRACTS OF JAPAN
ABS GRP NO: C503
ABS VOL NO: Vol. 12, No. 202
ABS PUB DATE: Jun. 10, 1988
05 SEP 92 16:50:06 U.S. Patent & Trademark Office P0076

63-4842 Jan. 9, 1988 L15: 6 of 16
METHOD FOR CONTROLLING SYNTHESIS OF HYPER FINE POWDER BY PLASMA REACTION

INT-CL: B01J 19*08

ABSTRACT:

PURPOSE:To stabilize the vaporization and supply of a solid raw material and high-frequency Plasma by monitoring the luminance of the raw material element, etc., through a spectral analysis means, and performing a specified control on the basis of the results in the synthesis of hyper fine powder by Plasma reaction.

CONSTITUTION:When AlN is synthesized with AlCl.sub.3 as the raw material, for example, N.sub.2 is supplied into a heating furnace 29 as a gaseous
05 SEP 92 16:50:16 U.S. Patent & Trademark Office P0077

63-4842 Jan. 9, 1988 L15: 6 of 16
METHOD FOR CONTROLLING SYNTHESIS OF HYPER FINE POWDER BY PLASMA REACTION

reactant, and N.sub.2 is supplied into a heating furnace 29 as a gaseous reactant, and N.sub.2 and Ar are supplied into a reaction furnace 28. The light from Plasma 27 is injected into a spectroscope 1 and analyzed. A group of signals from a detector 3 are then injected into OMA4, and the intensity of the spectrum is calculated. The output is monitored and inputted to a microcomputer 8. The process is controlled on the basis of the results so that the highest spectrum intensity is obtained. The raw material 30 consisting of AlCl.sub.3 is heated and sublimed, and the sublimate is sent to an upper chamber 31b. When a raw material container 31 is kept at a constant temp., the spectrum intensity regarding AlCl.sub.3 is measured on the basis of the emission-spectroscopic data, and the process is controlled to keep the value at a constant value.
05 SEP 92 16:50:29 U.S. Patent & Trademark Office P0078

62-282636 Dec. 8, 1987 L15: 7 of 16
PRODUCTION OF ULTRA-FINE CERAMIC POWDER BY UTLIZING HIGH- FREQUENCY PLASMA

INVENTOR: RYOJI SEDAKA, et al. (3)
ASSIGNEE: FURUKAWA ELECTRIC CO LTD:THE
APPL NO: 61-127645
DATE FILED: Jun. 2, 1986
PATENT ABSTRACTS OF JAPAN
ABS GRP NO: C498

ABS VOL NO: Vol. 12, No. 176
ABS PUB DATE: May 25, 1988
INT-CL: B01J 19*08; C01B 21*072; C01G 25*02

05 SEP 92 16:50:38 U.S. Patent & Trademark Office P0079

62-282636 Dec. 8, 1987 L15: 7 of 16
PRODUCTION OF ULTRA-FINE CERAMIC POWDER BY UTLIZING HIGH- FREQUENCY PLASMA

ABSTRACT:

PURPOSE:To produce the title high-purity ultra-fine powder with high productivity by allowing a base gas consisting of .gtoreq.50vol% diatomic molecule or polyatomic molecule to react with the gas of a metal or a metal halide while stably generating Plasma.

CONSTITUTION:The grid current of the oscillating tube of a Plasma generator is detected, the deviation between the detected quantity and a set value is obtained, impedance matching is carried out between a high-frequency power source and a high-frequency coil by changing the impedance of a turning

05 SEP 92 16:50:49 U.S. Patent & Trademark Office P0080

62-282636 Dec. 8, 1987 L15: 7 of 16
PRODUCTION OF ULTRA-FINE CERAMIC POWDER BY UTLIZING HIGH- FREQUENCY PLASMA

circuit in accordance with the deviation, and the grid current is controlled to a fixed value to stably maintain the Plasma. In the embodiment of the synthesis of AlN, the base gas (N.sub.2+Ar) 52 is sent from a gas inlet A to generate Plasma 43 by a work coil 44, then a solid material (AlCl.sub.3) 51 is sublimed, transported to the position of the work coil, made into Plasma, and allowed to react with N.sub.2, and AlN is synthesized. High-purity nitride, oxide, carbide, silicide, and boride can be obtained by this method.

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62-53734 Mar. 9, 1987 L15: 8 of 16
METHOD FOR PREPARING PARTICLE COATED WITH PLASMA POLYMERIZATION FILM HAVING AMINO ACID SELECTIVE ADSORBENCY

INVENTOR: YOSHIHITO OSADA, et al. (3)
ASSIGNEE: KANEBO LTD
APPL NO: 60-194599
05 SEP 92 16:54:21 U.S. Patent & Trademark Office P0094

62-53734 Mar. 9, 1987 L15: 8 of 16
METHOD FOR PREPARING PARTICLE COATED WITH PLASMA POLYMERIZATION FILM HAVING AMINO ACID SELECTIVE ADSORBENCY

DATE FILED: Sep. 2, 1985
PATENT ABSTRACTS OF JAPAN
ABS GRP NO: C439
ABS VOL NO: Vol. 11, No. 246
ABS PUB DATE: Aug. 11, 1987
INT-CL: B01J 19*08; B01D 15*00; C01B 33*157; C08G 85*00; //C07C 99*12; C08J 7*00

ABSTRACT:

PURPOSE:To perform polymerization and fixing camphor having optical activity

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METHOD FOR PREPARING PARTICLE COATED WITH PLASMA POLYMERIZATION FILM HAVING AMINO ACID SELECTIVE ADSORBENCY

by simple operation, by activating D-camphor in low temp. Plasma while contacting the activated camphor with fine particles to form a Plasma polymerization film to the surfaces of fine particles.

CONSTITUTION:For example, a Plasma polymerization container, wherein high- frequency wave 2 generated from a high-frequency power source 1 is supplied to the electrode 4 in a reaction container 3 through a matching box 2 to be applied between the electrode 4 and the earthed opposed electrode 5 and Plasma is generated in the reaction container 3, is used. D-camphor is received in the left and right containers 6, 6' of the electrodes while porous silica 20 is put in a glass container to be arranged between the electrodes. D-camphor is sublimed and high-frequency voltage is applied

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METHOD FOR PREPARING PARTICLE COATED WITH PLASMA POLYMERIZATION FILM HAVING AMINO ACID SELECTIVE ADSORBENCY

to the electrodes at the point of time of constant pressure to generate D-camphor Plasma and a Plasma polymerization film is formed to the surface of porous silica.

61-147530 Jul. 5, 1986 L15: 9 of 16
REACTIVE ION ETCHING METHOD

INVENTOR: KATSUHIRO HASEGAWA, et al. (1)
ASSIGNEE: TOSHIBA CORP
APPL NO: 59-269982
DATE FILED: Dec. 21, 1984

61-147530 Jul. 5, 1986 L15: 9 of 16
REACTIVE ION ETCHING METHOD

PATENT ABSTRACTS OF JAPAN
ABS GRP NO: E456
ABS VOL NO: Vol. 10, No. 343
ABS PUB DATE: Nov. 19, 1986
INT-CL: H01L 21*302

ABSTRACT:

PURPOSE:To sublime and remove reactive product having tide resolution by etching a material to be etched coated with aluminum or aluminum alloy film on the surface by a Plasma of chlorine gas in a vacuum chamber, and then removing the material from chamber to be heat treated.

61-147530 Jul. 5, 1986 L15: 9 of 16
REACTIVE ION ETCHING METHOD

CONSTITUTION:After a shutter 5b is closed, mixture gas of BC.sub.3 and C.sub.2 is supplied from a gas intake tube 8 into an etching chamber 4, and gas in the chamber 4 is exhausted from an exhaust tube 13b. High frequency power is applied from a high frequency power source 12 to a lower electrode 7

to selectively etch an aluminum film. A shutter 5c is opened in the state that the gas is exhausted from an exhaust tube 13c, and a waver 19 is conveyed to a postpreliminary exhaust chamber 3b. The shutter 5c is closed, and the chamber 3b communicates with atmosphere. A shutter 5d is opened, the wafer 19 is removed, and conveyed on a hot plate 14. Simultaneously, dry nitrogen is supplied from an intake tube 18 into a hollow vessel 16, and nitrogen heated by a heater 17 is blown from the nozzle of a vessel 16 to the wafer 19.

61-147530 Jul. 5, 1986 L15: 9 of 16
REACTIVE ION ETCHING METHOD

57-201016 Dec. 9, 1982 L15: 10 of 16
CLEANING METHOD FOR SEMICONDUCTOR MANUFACTURINGAPPARATUS

INVENTOR: KENJI ANZAI
ASSIGNEE: OKI DENKI KOGYO KK
APPL NO: 56-85644
DATE FILED: Jun. 5, 1981
PATENT ABSTRACTS OF JAPAN
ABS GRP NO: E161
ABS VOL NO: Vol. 7, No. 49
ABS PUB DATE: Feb. 25, 1983

57-201016 Dec. 9, 1982 L15: 10 of 16
CLEANING METHOD FOR SEMICONDUCTOR MANUFACTURINGAPPARATUS

INT-CL: H01L 21*205; H01L 21*22; H01L 21*302

ABSTRACT:

PURPOSE:To sublime and remove a solid accumulated material by generating a Plasma in a furnace.

CONSTITUTION:Remaining gas in a reaction furnace 1 is exhausted by a vacuum pump 14, cleaning gas 11 is led from a gas flow inlet tube 5 into the furnace 1 to maintain vacuum state. Then, high frequency electric field is applied to the electrodes 12, 13 to generate a Plasma between the electrodes 12 and 13, thereby simultaneously subliming and removing the solid accumulated

57-201016 Dec. 9, 1982 L15: 10 of 16
CLEANING METHOD FOR SEMICONDUCTOR MANUFACTURINGAPPARATUS

material remaining in the furnace and tube system. In case that the accumulated material is silicon or silicon compound, Freon gas (CF.sub.4) is used as a cleaning gas, and when the material is organic material, oxygen gas (O.sub.2) is used as the cleaning gas.

57-158371 Sep. 30, 1982 L15: 11 of 16
FORMATION OF METALLIC THIN FILM

INVENTOR: TAKASHI ITOU
ASSIGNEE: FUJITSU KK
APPL NO: 56-42211
DATE FILED: Mar. 23, 1981

57-158371 Sep. 30, 1982 L15: 11 of 16
FORMATION OF METALLIC THIN FILM

PATENT ABSTRACTS OF JAPAN

ABS GRP NO: C142
ABS VOL NO: Vol. 6, No. 266
ABS PUB DATE: Dec. 25, 1982
INT-CL: C23C 11*02; //H01L 21*285

ABSTRACT:

PURPOSE:To form a uniform thin Al film even on a substrate with a large step without causing breaking by dissociating AlX.sub.3 (X is halogen) in a gaseous Plasma atmosphere and depositing the formed metallic Al on the surface of the substrate at a specified temp.
05 SEP 92 16:55:53 U.S. Patent & Trademark Office P0103

57-158371 Sep. 30, 1982 L15: 11 of 16
FORMATION OF METALLIC THIN FILM

CONSTITUTION:AlX.sub.3 9 as starting material in a container 8 is Sublimed by heating with a heating furnace 10. Gaseous H.sub.2 is introduced as a carrier gas from an inlet 11. the internal pressure of a reactive tube 1 is suitably kept by evacuation from an exhaust port 7 and the introduction of H.sub.2 or an inert gas from an inlet 12. A susceptor 3 is heated to a temp. below the m.p. of Al and above the sublimation temp. of AlX.sub.3 with a high frequency coil 2. At the same time, Plasma is generated in the gaseous H.sub.2 contg. AlX.sub.3 in the tube 1, the AlX.sub.3 is dissociated, and a thin Al film is formed on the surface of an si wafer 4. Even in case of a substrate with a step obtd. by forming an SiO.sub.2 pattern on the wafer 4, Al is deposited on the surface of the substrate and the surface of the SiO.sub.2 wall in the almost same thickness.
05 SEP 92 16:56:06 U.S. Patent & Trademark Office P0104

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FORMATION OF METALLIC THIN FILM

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US PAT NO: 4,824,753 L23: 6 of 24
TITLE: Carrier coated with plasma-polymerized film and apparatus for preparing same
US-CL-CURRENT: 430/108, 137
05 SEP 92 17:02:16 U.S. Patent & Trademark Office P0128

US PAT NO: 4,505,947 [IMAGE AVAILABLE] L23: 10 of 24
TITLE: Method for the deposition of coatings upon substrates utilizing a high pressure, non-local thermal equilibrium arc plasma
US-CL-CURRENT: 427/34; 204/192.1, 298.41; 219/121.47; 376/916; 427/37, 423

US PAT NO: 4,212,719 L23: 20 of 24
TITLE: Method of plasma initiated polymerization
US-CL-CURRENT: 204/165, 168, 169

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US PAT NO: 4,824,753 L23: 6 of 24
DATE FILED: Apr. 23, 1987
05 SEP 92 17:02:45 U.S. Patent & Trademark Office P0129